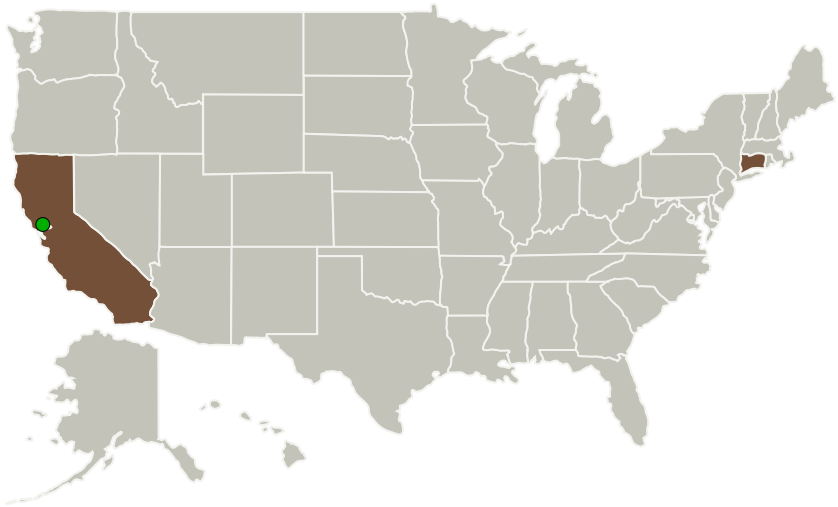
Fusion of Built in Test (BIT) Technologies with Embeddable Fault Tolerant Techniques for Power System and Drives in Space Exploration, Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

Impact Technologies has proposed development of an effective prognostic and fault accommodation system for critical DC power systems including PV systems. Overall goal for this program is development of techniques that enable power system fault tolerance based on diagnostic features from the solar cells, power bus, and power transistors. After completion of Phase I efforts towards this goal, Impact has achieved substantial and promising results in several technical areas that provide opportunities for maturing PHM tools. The technical areas covered include: 1) solar cell modeling and characterization, 2) power system monitoring, 3) semiconductor device modeling and aging characterization, and 4) application of the leakage current sensing to DC systems. During Phase II, impact will apply and maturing phase I accomplishments to incorporate and embed effective PHM techniques and fault tolerance for power system reliability and extended operation. Impact also plans development of a prototype low cost dynamic leakage current sensor for solar cell and DC power system application. The long-term implications of a successful completion of this program will provide reliability and health management tools for the state-of-the-art technologies, such as advanced power systems based on solar power generation, contributing directly to NASA's ISHM efforts.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Connecticut

Project Transitions

June 2011: Project Start

August 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138887)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

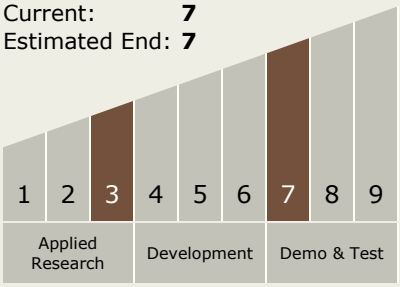
Carlos Torrez

Principal Investigator:

Patrick Kalgren

Technology Maturity (TRL)

Start: **3**
Current: **7**
Estimated End: **7**



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.2 Navigation Technologies
    - TX17.2.3 Navigation Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System